



ATIS NEWS

Volume 2, Issue 2

Fall 1998

Creating a Statewide transportation database

The Arizona Department of Transportation (ADOT) is in the process of creating a statewide transportation database. What began as a tool for locating and identifying accidents on the state highway system has grown into a GIS coverage that we refer to as Arizona Transportation Information System Roads (or ATIS Roads). ATIS Roads contains upwards of 47,569 miles of centerlines. It sounds good so far, but when you get down to actually using the ATIS Roads coverage for a GIS project, you will find some problems.

The most significant problems with ATIS Roads are:

1. lack of new and realigned roads and streets;
2. incorrect or outdated attributes;
3. traffic interchanges lack

identifying names (currently these are identified by an ADOT code number);

4. many mileposts have been moved or replaced;
5. lack of connectivity from ramps to routes; and,
6. there are no address ranges associated with any of the roads (an important attribute when doing geocoding).

Unfortunately, mostly due to departmental downsizing in the early 1990's, ADOT has a GIS staff of two. Daily demands for data and maps leave very little time for focusing on updates to the ATIS Roads coverage. However, we are making some progress, though slowly, in our update efforts.

Currently the ADOT Data Team is using a SATLOCK differential GPS unit to collect

When you get down to actually using the ATIS Roads coverage for a GIS project, you will find some problems.

centerline and milepost data in both directions on the entire State road network. Once collected, the GPS data is converted to an ArcView shape file and compared with the current ATIS Roads centerline data. When significant discrepancies are found in the current data, the GPS data will be used to update and create a more accurate ATIS Roads coverage.

One other ongoing update
(Continued on page 2)

The Results are in!

Thank you to everyone who answered the User Group Survey from the last issue of ATIS News. The responses show a variety of interests in GIS related activities. Some of the responses received in regards to the

question on how GIS is used, or planned on being used were:

- A school library has ArcView installed and available for students and

faculty.

- Development of GIS data, data standards and core data sets.
- Geocoding and analysis of data.

(Continued on page 2)

Inside this issue:

| | |
|------------------------|---|
| GIS User Story | 3 |
| ArcView 3.1 Is Here! | 3 |
| AGIC Conference Report | 4 |
| Report from San Diego | 5 |
| ArcView Extensions | 6 |
| Worthy WebSites | 7 |

Upcoming Events

- North American Cartographic Information Society (NACIS) 18th Annual Conference
October 7-10, 1998 in Milwaukee, Wisconsin
- ESRI SW User Group Conference 1998
October 13-14, 1998 in Jackson, Wyoming
- GIS User Group meeting
October 27, 1998 in Phoenix Arizona
- GIS/LIS '98
November 8-12, 1998 in Fort Worth, Texas
- GIS '99/Geosolutions
March 1-4, 1999 in Vancouver, BC
- GIS-T 99
March 29-31, 1999 in San Diego, California

(see page 4 for details)

Statewide Transportation Database *(continued)*

(Continued from page 1)

is the ramp connectivity project. One of our two GIS Analysts is currently working on connecting all the ramps to the State road network. This is a tedious and time consuming task as each intersection must be addressed individually.

To assist ADOT in addressing the problems with the ATIS Roads coverage, we are in the process of developing an agreement with private sector contractor. According to the proposed agreement, the contractor will be responsible for assisting ADOT by developing ARC/INFO and ArcView tools to aid in the update process. Additionally, ADOT is in the process of acquiring an additional GIS Analyst to assist with the current workload.

Most important of all, ADOT is working

to supplement the ATIS Roads database with centerline data from Councils of Governments (COGs), Metropolitan Planning Organizations (MPOs), Federal agencies, and Local Governmental Agencies (LGAs). This cooperative effort, which is a primary attribute of GIS, will help in creating a state wide transportation database (or base map) that can be utilized by GIS operations throughout Arizona.

At the September 3, 1998 meeting of the Arizona Geographic Information Council (AGIC) the Executive Board passed a motion to assist ADOT in the update of ATIS Roads by having the State Cartographer's Office research and apply for Federal grant monies. The Federal funds would be matched to State money, providing additional support in the effort to create a statewide

transportation database that all agencies can use.

It is our hope that within two years ADOT will be able to supply a complete and accurate transportation database for use in GIS activities throughout the state. Whether your need is to determine "cancer cluster" areas or to route hazardous and oversized trucks safely across the state, you need to start with an accurate transportation base map. With the support of the Arizona GIS community, ADOT will create and maintain a statewide transportation database.

For additional information on the ATIS Roads project contact Tony Gonzales at (602) 255-7818 or Jami Garrison at (602) 255-8958. A

ATIS NEWS

ATIS News is published by the Arizona Department of Transportation (ADOT), Transportation Planning Group to support and promote the use of GIS in ADOT. Our Staff members are:

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If you are not currently on our mailing list and would like to be, contact Jami Garrison at the contact information listed below. Comments, questions or articles may also be submitted. Deadline for submissions to the Winter 1998/99 issue is December 4, 1998.

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The results are in! *(continued)*

(Continued from page 1)

- College plans to use GIS for planning enrollment and analyzing demographic trends. Additionally, they plan to use GIS to aid in instruction of various disciplines (e.g. sociology, geography, archeology and more).
- GIS lab for use in community based efforts in the area of youth violence prevention.
- To create graphics and maps.
- Presentation of census and economic data. Economic and demographic analysis.
- Epidemiological studies.
- Crime mapping and criminal justice applications.

Additionally, the majority of respondents indicated that they'd like to be a part of the GIS user group to gain a better knowledge of GIS and as a vehicle for resource (or data) sharing.

When asked how you would like to interact with the User Group, the majority of respondents wanted to interact via email (or ListServ), through the newsletter (both printed and online), and through occasional User Group meetings.

For topics to be covered in the newslet-

ter and on the webpage, the biggest vote getter was for information on data resources (or how and where to get data). Coming in with a close second was information on upcoming seminars and training opportunities. And, not to be overlooked, a little more than half of the respondents wanted to see information on technical tips and techniques as well as socio-economic applications involving GIS.

***The first User Group meeting will
be October 27th in Phoenix***

This survey gives us a good start on building objectives for the User Group. But, to build a good User Group we need to get together and brainstorm ideas for what direction the group should take from here. We have scheduled the first User Group meeting for Tuesday, October 27, 1998 from 1:30 to 3:30 in the afternoon. The meeting will be held at ADOT's Engineering Building located at 205 S 17th Avenue, Phoenix, in the Arizona Room. Come prepared to share ideas, meet new people and be a part of your User Group! If you need additional information, contact Jami Garrison at (602) 255-8958 or Tony Gonzales at (602) 255-7818. A

Real World GIS: A User Story

G.I.S. and ADOT Contract Maintenance Services

By Patrick Stone, Transportation Maintenance Management Analyst I

Contract Maintenance Services is one of the latest areas in ADOT to take advantage of GIS technology. Contract Maintenance is responsible for drawing up specifications for maintenance contracts. Users in the field notify us with the type of project they want to do, then we prepare the paperwork to let potential bidders know what the project entails. This paperwork includes various maps.

After attending the two-day session of

ArcView classes offered by Tony Gonzales (with the valuable assistance of Jami Garrison), we were ready to start using GIS for our map preparation. Our section uses maps in almost every solicitation to describe the work location, as well as any landscape features that may have an impact on the contractor's ability to perform their job. Prior to GIS these maps were a hodgepodge of various preexisting maps that were literally cut and pasted together. Although these maps worked, they could definitely be improved! This is where GIS has come to the rescue. With the clip-



ping features and multitude of different map views, we are now able to make maps that give potential bidders precise work locations based on criteria we select. We can show just those features that are important and eliminate any unnecessary clutter. Also, we are able to use customized legends and scale bars to give our maps a professional feel.

Editor's Note: If you would like to submit your GIS user story for an upcoming issue of ATIS News, please contact Jami Garrison at (602) 255-8958 or email your story to garrison@dot.state.az.us

Arcview version 3.1 now shipping!

Redlands, California--ESRI, the world leader in geographic information system (GIS) software, mapping components, and spatial database management tools, is pleased to announce that ArcView GIS Version 3.1 is now shipping.

The Features You Need

ArcView GIS Version 3.1 includes over 500 new features and enhancements, providing you with a more robust platform for your geographic information system (GIS) applications. Of special note, Version 3.1 introduces a wizard-based approach to accomplishing a variety of more sophisticated tasks such as advanced map production and advanced geoprocessing. ArcView GIS Version 3.1 contains improved cartographic compatibility with ARC/INFO software and includes hundreds of new symbols for better map composition.

A variety of new tools are introduced, along with integrated report-writing capabilities, new and updated data, plus hundreds of added symbols for improved map display and interpretation. The newest release of ArcView GIS contains new and improved extensions. The Dialog Designer extension has been updated for better GIS application development. Also included is an enhanced Database Access extension

offering improved access to enterprise information resources, an updated CADReader extension for AutoCAD Release 14, and an MGE Reader extension for projects created in Intergraph's MGE, MicroStation GeoGraphics (MSG), and design files with associated database linkages. New direct data readers are included such as TIFF 6.0 and MrSID.

And, one of the most important new features of all, pressing ESC will immediately stop the drawing of themes without clearing the view's display.

New and Improved Data

Also included is nearly 3 gigabytes of new and updated data. ArcView GIS version 3.1 expands on the Canada, Mexico, USA and World data that was included in the last release by adding new European data sets. In addition, all data sets will be accompanied with legend files (.avl). ArcView 3.1 will automatically open the legend files when the data set is added to a view, thus providing symbols and classifications for the theme.

ArcView GIS Version 3.1 is available for Windows 95/98, Windows NT, and select UNIX platforms. For more information or to order ArcView GIS Version 3.1, call ESRI at 1-800-447-9778. Or visit ESRI online at www.esri.com. A



What's new in ArcView GIS 3.1

- ESC key support! Pressing ESC stops drawing of themes and cancels directory scan for Add Theme
- Professional map production wizards (graticules, neatlines, advanced legends, etc.)
- Easy-to-use geoprocessing and analysis wizards (buffer, clip, merge, spatial, join, etc.)
- Integrated Report Writer (Seagate Crystal Reports)
- Improved labeling tools (callouts, highway signs, spline text, etc.)
- Open image integration (add any image format)
- AutoCAD Release 14 and three-dimensional VPF support
- More than 500 new symbols for points and lines
- Nearly 3 GB of new and updated data (block groups, improved highways, updated ZIP Codes, and more)
- Improved database access for enterprise solutions
- Enhanced Dialog Designer
- Projection and datum transformation

Upcoming conferences and events

Give yourself an edge by attending a GIS conference. Conferences are a great way to network with other GIS users, catch up on the latest technology advances and expand your knowledge of GIS.

NACIS Annual Conference

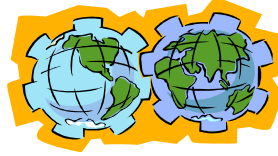
The North American Cartographic Information Society (NACIS) is hosting its 18th annual conference October 7-10, 1998 in Milwaukee, Wisconsin. A complete program listing and preliminary agenda can be found on their website at www.nacis.org.

SWUG '98

"Geography Matters" ESRI Southwest Users Group 1998 Annual Conference will be held October 13-14 at the Snow King Resort in Jackson, Wyoming. For more information contact Connie Skoetsch at (307) 777-5957 or email cskoet@missc.state.wy.us or visit their website at <http://wgjac.state.wy.us/wgjac/swug.html>.

GIS User Group Meeting

The newly formed User Group (so far unnamed!) that was announced in the



last issue of our newsletter will have its first meeting in Phoenix on October 27, 1998. The meeting will be held in the Arizona Room at ADOT's Engineering building at 205 South 17th Avenue in Phoenix. We plan on having a brainstorming session to determine the groups objectives and direction, a GIS presentation and possibly a training presentation. For additional information call Jami Garrison at (602) 255-8958 or email her at jgarrison@dot.state.az.us.

GIS/LIS '98

The GIS/LIS '98 Annual Conference and Exposition will be held Nov. 10-12, 1998, in Fort Worth, Texas. The goals of this year's event are to foster intellectual and professional interaction among individuals and groups interested in the design and use of GIS, land information systems (LIS), and related specialties and technologies. For information, contact the GIS/LIS registrar at the American Congress on Surveying and Mapping, 5410 Grosvenor Lane, Ste 100, Be-

thesda, MD 20814 (301)493-0200.
GIS '99

GIS'99 will be held March 1-4, 1999 in beautiful Vancouver, British Columbia. The upcoming event will not follow the traditional 'mega-conference' format. They have created a more interactive, solution oriented program with vertically integrated 'mini-conferences' centered around Canada's largest GIS Trade Show. Major themes of the conference will be Precision GPS, Forestry and Natural Resources, Business Geographics, Internet GIS, Data and more. For more information visit their website at www.gis99.com or contact Claudia Sitar at (203)445-9265 or email csitar@aip.com.

GIS-T '99

The Geographic Information Systems for Transportation Symposium will be held March 28-31, 1999 in San Diego, California. The purpose of GIS-T is to provide a forum for transportation officials from State, Province, Federal, and Municipal Agencies to discuss GIS and transportation issues. For additional information visit the GIS-T '99 website at <http://gis.dot.state.mn.us> or contact Diane Pierzinski at (916) 654-3379 or email diane.pierzinski@dot.ca.gov. Å

fifth Annual agic conference a success

By Jami Garrison, roving reporter

AGIC conference: The place to be for Arizona GIS Users

For Arizona GIS users one of the best conferences to attend annually is the Arizona Geographic Information Council (AGIC) GIS Conference. This was the fifth year AGIC has hosted a GIS Conference in Arizona. Having been to all but one of the conferences, I can honestly say that it just gets better and better. This year's conference was held August 10th and 11th at the ASU Memorial Union in Tempe. The annual AGIC conference is *the best* opportunity of the year to get together and interact with GIS users from across Arizona.

This year's sessions included topics on

Natural Resources, Education, Technology, GIS Management, and Data Development and Maintenance (just to name a few!) There were two keynote addresses. The first was an informative presentation on the future strategies for GIS availability, utility and access from Kathryn Clement, the USGS NMD Acting Associate Division Chief. The second keynote address was given by John Kelly, the Director of the State of Arizona Government Information Technology Agency (GITA), on "GIS: A Tool for Democracy."

Any conference would not be complete without vendor representation! There was a good representation of vendors at this year's conference. Everything from GPS units and plotters to GIS (and

related) software and enhanced technology was available for evaluation. Most of the vendors submitted gifts that were raffled off at the evening social hour. (*Hey, I even won a nice polo shirt from Landiscor!*)

For those of you wanting to see a good representation of GIS applications, the Poster Session is a must see. A wide variety of maps were on display depicting the diverse use of GIS across the state. Some of the applications displayed in the Poster session included City applications, demographic analysis, environmental applications, traffic routing, health services and water resource applications.

(Continued on page 7)

Report from San Diego

By Jami Garrison, roving reporter

After 6 years of using ESRI products, I was finally able to attend the annual ESRI User Conference this past July. The 1998 ESRI User Conference was the biggest and most successful ever. This was only the second year ESRI held its annual conference in San Diego; previously it had been held in Palm Springs, which they quickly out grew! It was a busy week, with plenty of workshops, presentations and social activities. More than 8,000 people, representing 91 countries around the world, came to the event. I'd have to say that if you can only attend one GIS event a year, the ESRI User Conference is the one to go to!



I wasn't able to get a reservation at the Ramada St. James Hotel with the rest of the "Zonies," where I understand a lot of exciting things happened (don't worry, I won't even get into that topic)! But, I was able to get a decent room at Bristol Court, about 5 blocks north of the San Diego Convention Center, where the conference was held. This made for a nice walk each day in the beautiful San Diego sunshine and salty sea air!

The opening day presentations kicked

off the official release of the latest version of ArcView (version 3.1, see page 3 for more on the new version), as well as a look at what's in store for the upcoming release of ARC/INFO version 8.0.

Additionally, the Map Gallery was officially opened with hundreds of maps from around the world. It was an impressive display of GIS talent!

Tuesday through Thursday were packed with workshops and sessions on all aspects of GIS use. I attended a full slate of workshops from putting maps on the web with Internet Map Server to the elements of Dynamic Segmentation. I also managed to squeeze in a few sessions on transportation issues such as routing and pavement management.

The ESRI Showcase was a great place to meet one-on-one with ESRI staff members. I especially liked the "Doctor's Office" where technical support personnel and applications development staff were on hand to answer my questions and offer suggestions. ESRI even had a Conference Store and Bookstore set up where the eager GISers could get their hands on the just released ArcView 3.1.

And then there was the Exhibit Pavilion.

Over 100 companies set up booths to promote their latest products and services. Of course, those giving away t-shirts and other popular items were the busiest! And, while I didn't come home with the popular Hewlett-Packard t-shirt (the line was much too long), I did manage to pick up several new coffee mugs, a baseball, a yo-yo and, of course, plenty of mouse pads! Yes, the freebies are fun, but interacting with the vendors, finding out about new products, and learning what types of services are being offered, can be invaluable the next time you start a seemingly impossible project.

There were plenty of social activities going on throughout the week, like a tennis tournament, golf tournament and this year's dinner social event, the Renaissance Faire at Balboa Park. If those aren't enough for you, you can even escape to Sea World or Tijuana for a day!

Overall it was a great week of learning and meeting new people. I'm already making plans to attend next year. The Nineteenth Annual ESRI User Conference is scheduled for July 26-30, 1999 in San Diego – mark your calendar! A

ZONIES INVADE SAN DIEGO!

Heading home after a week at the 1998 ESRI International User Conference, but not quite ready to leave the beautiful California coast are:

(from left to right)
Bill O'Sullivan of the State Land Dept.; Gary Irish of the State Land Dept.; Jami Garrison of the Arizona Dept of Transportation; Santiago Garcia of the State Cartographer's Office and his wife, Belem Garcia.



Arcview extensions



In our last issue we explained how to add one of the many sample extensions that come with ArcView 3.0x to your project. We also provided a comprehensive list of the sample extensions that come with ArcView 3.0x. Many of the extensions that come with ArcView 3.0x are now a part of the latest version of ArcView, version 3.1. For instance, the labeling tool, which we discussed in detail in our last issue, is now integrated into ArcView 3.1, though it has been enhanced with additional features. The Buffer, Projector and MapTools sample extensions are also now part of the latest release of ArcView.

In our last issue we promised to give you an explanation of the MapTools extension for ArcView 3.0x. So, for those of you who have not yet upgraded, here's one way to get a bit of the upgraded functionality out of your "old" version of ArcView.

MapTools

The MapTools extension provides tools for placing graticules in Views and Layouts, placing neatlines around graphics in layouts, and for making multiple column legends and nested graduated symbol legends (for graduated pie charts) in layouts.



Within your view the MapTools extension adds a new *button* (the spider-web looking icon on the left). This button is for creating graticules (a network of lines representing a selection of the Earth's parallels and meridians) and tics in the view. It offers several options and you may specify the interval between each graticule line or between each tic mark. Your view must be projected in order to use this feature. (This button is also added to your layout button bar as well).



A new tool is also added to your toolbar when working with a view (see icon on left). The tool is for creating a labeled index grid on your view. To use, zoom to just beyond the extent of the theme you want to place the grid upon. Then, using this tool, drag a rectangle around the extent of the area

to be contained within the grid.

When working with a layout you will see two additional buttons on the button bar as well as two new tools on the tool bar.



These are the two buttons that show up on the button bar when working with a layout and the MapTools extension. The spider-web looking button works just like it does in your view; it adds graticule lines to your layout. The button next to that is for creating a neatline on your page. There are two options with the neatline button: 1) neatline inside the page margins (it will prompt you for the distance); and 2) bounding line around the graphic (it will also prompt you for the distance).



The two new tools on your tool bar are for making multiple column legends (the left button) and for creating a nested legend for pie charts that have a size field (the button on the right, with the pie chart symbol on it).

The multiple column tool creates a graphic legend for a view in a layout document. The view does not have to be in the layout. You can choose which themes are to be included, whether to make one column per theme or a specific number of columns, and what title you want to use.

When I tested this tool, it worked fine with a multi-column line symbol legend, but for polygons and points I got some strange results and an Avenue error. However, it does save some time in creating a multi-column legend. And the entire legend is created as a group of graphics so you can always ungroup them and fix them to your liking.

The nested legend for pie charts with a size field is a nice tool. It creates labeled nested circles based on the theme legend properties.

Overall, though not perfect, these are some decent tools for enhancing your maps. And, best of all, they come as a free with your ArcView 3.0a. They can also be downloaded from the ESRI website at <http://www.esri.com>. A

Knowledge base

A German company has created a wonderful, searchable Knowledge Base of all Arc/Info and ArcView ListServ summaries. The site is searchable by keyword or by date.

For those of you who would rather query all ListServ summaries than to receive 10 or more emails a day from the ListServ, this is a life saver!

The site is updated weekly and can be accessed through your web browser at www.gfi-gis.de/en/services/avkb.

Gfi is a Germany-based application developer specializing in Arc/Info, ArcView and Map Objects applications. You can access their homepage directly from the Knowledge Base.

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Worthy websites



ADOT TRAILMASTER

<http://www.azfms.com>

Want to know what roads are closed along your chosen route to the Grand Canyon? Well look no farther than www.azfms.com. The Arizona Department of Transportation's (ADOT) Trailmaster website has a real time map of road closures and other traffic related incidents for all of Arizona. There are also links to real-time camera views along the metro-phoenix freeways with a real time current freeway speed map as well. There is also a link to the online Valley Metro bus book from the Trailmaster homepage.

GEOPLACE.COM

<http://www.geoplace.com>

They call themselves the "World's Largest Provider of Geospatial Information." One visit to their website at www.geoplace.com, and you will see why! GeoPlace.com is the publisher for these magazines online: Business Geographics, GIS WORLD, GIS Europe, Mapping Awareness, Geoinformation Africa. Business Geographics and GIS World have a complete online version of the printed magazine, while the other three magazines offer selected articles only in their online version. GeoPlace.com also has an extensive GIS bookstore, with online ordering available, a listing of upcoming GIS conferences, and current GIS-related news.

TRIMBLE

<http://www.trimble.com>

Trimble is a world leader in the emerging commercial markets for GPS satellite-based navigation, positioning, and communications data products. Trimble recently unveiled an extensive web page to provide information about how its products will perform during the upcoming Global Positioning System (GPS) Week Number Roll Over and Year 2000 events. The Website, at www.trimble.com/y2kwnro, is believed to be the first of its kind compiled by a major manufacturer of GPS receivers. In addition to spelling out the company's policy, the site contains a listing of the company's products and the status of analysis of their performance.

THE MASSACHUSETTS ELECTRONIC ATLAS

<http://icg.harvard.edu/~maps.maAtlas.htm>

The Massachusetts Electronic Atlas is a prototype project allowing Internet users to create and query maps displaying information about Massachusetts. It provides a web interface where users of all skill levels can create, manipulate, and download maps and data for the Commonwealth of Massachusetts. The maps are powered by ESRI's ArcView Internet Map Server (IMS) and provide an excellent example of how ArcView IMS can be used to power GIS applications on the internet.

agic conference (continued)

(Continued from page 4)

The major benefit to attending the AGIC conference is the opportunity to develop relationships with other GIS users in Arizona. It is these relationships that have fostered, and will continue to foster, the growth of the Arizona GIS community. The cooperation and combining of efforts has become increasingly important in the development, implementation, maintenance, and funding of projects that support the mutual needs of the GIS community. If you have never been to the AGIC conference, I urge you to get involved in next year's event. Currently the AGIC staff members are researching alternate locations

and times for the annual conference. You can still get involved! They are always looking for user ideas, posters and presentations.

For more information on how you can be a part of AGIC, contact Santiago Garcia or Gene Trobia of the State Cartographer's Office at (602) 542-4060. Or, better yet, why not attend the next AGIC meeting? The next meeting is scheduled for Thursday, November 8th at 1:30 pm in the lower-level conference room at the Arizona Department of Revenue, 1600 West Monroe in Phoenix. Visit AGIC on the web <http://www.land.state.az.us/agic/agichome.html> A

Local Training

ATIS Tools and HPMS training will be conducted for local government employees who are involved (or will be involved) in submitting HPMS data to ADOT. The training will be a 2-day session; one day of ArcView training and the other day for HPMS/ATIS tools training. (Note: The ArcView training will **not** be the certified ESRI course, but an abbreviated course designed to compliment the HPMS/ATIS tools training). ADOT staff will travel to various locations around the state to conduct this course. Please call Mark Catchpole at (602) 255-8596 for more information on this training course.

ADOT provides ESRI certified training three times a year at no or little cost for ADOT employees. For non-ADOT employees, the same certified class is available through private entities for around \$350. A list of certified instructors can be found on ESRI's web site at <http://www.esri.com>. A

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The First Ever (still unnamed) User Group Meeting will be held October 27, 1998! Mark your calendar now! The meeting will held in Phoenix from 1:30 p. m. to 3:30 p.m. at ADOT's Engineering building located at 205 South 17th Avenue in the Arizona Room. For more information contact Jami Garrison at (602) 255-8958 or jgarrison@dot.state.az.us.

